

BUTTERFLIES IN THE BENASQUE VALLEY, SPAIN

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THE BENASQUE VALLEY lies in the Spanish Pyrenees between the Ordesa National Park to the west and the Vall d'Aran to the east. The area was visited in May 1991, June 1994 and July/August 1991 and 1993 to investigate the butterfly fauna. The spring butterflies have already been described (Wakeham-Dawson, 1992a), as have the *Erebia* species found flying in July/early August (Wakeham-Dawson, 1992b). The current paper reports on butterflies seen during a visit to the valley between 22 and 29 September 1996 (Appendix 1), but also discusses some of the more interesting species that fly earlier in the year. During the September visit, the weather was warm and dry and the leaves had not begun to change colour or fall. Snow was lying on the peaks of the taller mountains. A farmer's wife at Chia reported that it had been a very wet summer in 1996.

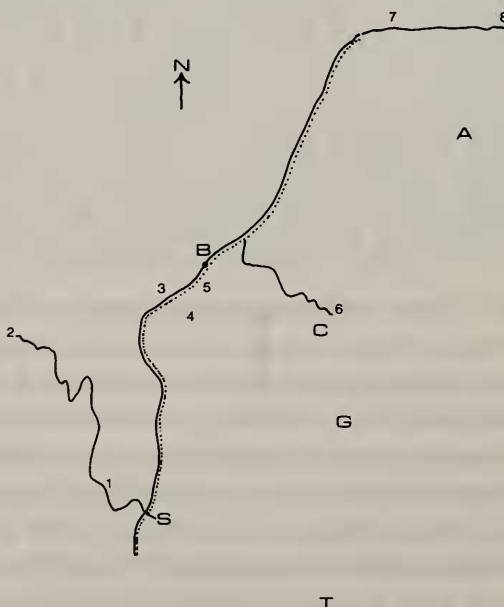
Habitat types

The Benasque Valley is cut by the River Esera (Fig. 1). Initially the Esera flows east to west fed by streams from mountains in the Maladeta range (which includes Pico de Aneto), but then turns south. Between the towns of Benasque and Castejón de Sos (c. 14 km), the valley floor is at c. 1000m above sea level. The valley sides are steep and rise to high mountain peaks such as Pico de Aneto (3404m), El Gallinero (2728m), El Turbón (2492m) and Pico de Cerler (2407m). Vegetation is stratified up the valley sides providing a range of habitat types that support a rich flora and associated butterfly species (some of which are endemic to the Pyrenees). The vegetation can be classified into five main habitat types (not including the alpine habitat of high mountain peaks). These are listed here with an indication of the altitude ranges in which they occur. These habitats can be found throughout the Benasque Valley and similar valleys in the region, but a number of areas which are good examples of each type are given below.

1. Terrace meadows (1000 - 1400m) along the banks of the Esera and on the lower valley slopes. These meadows (and the sub-alpine pastures discussed below) have developed a rich flora and fauna through extensive hay making and grazing with farm livestock over the last thousand years. A moderate intensity of grazing or mowing keeps the vegetation at a height and diversity which suits many lepidopteran communities (Montesinos, 1994). However, changes in farming practices which lead to the abandonment of traditional pastoral systems (often accompanied by under- or over-grazing) or to the introduction of more intensive management methods (especially the

use of artificial fertiliser to improve agricultural productivity) are endangering mountain meadows throughout Europe (Bignal & McCracken, 1992). In the Benasque Valley, some of the larger meadows have been subjected to mechanical mowing and fertiliser application which has resulted in a poor flora, often dominated by sown agricultural grass species. However, around the villages of Eriste and Anciles the meadows are too small or steep for 'improvement' of the grassland. Even in late September, there were many plants still in flower and butterflies including *Erebia neoridas* Boisduval, *Colias alfacariensis* Ribbe, *Hesperia comma* L. and very worn *Agrodiaetus damon* D. & S. In June and July, *Maculinea arion obscura* Christ and *M. alcon rebeli* Hirschke (Wakeham-Dawson, 1996) had been flying. *Gentiana cruciata*, the *rebeli* larval food plant, had been in flower. By September, the blue flowers had been replaced by seedheads full of small seeds and the leaves were yellow and weathered. A number of plants still had white *rebeli* eggs at the base of the seedheads and on the smaller leaves at the top of the plants. These were dead and inspection under a x10 lens showed no sign that larvae had hatched from them. Perhaps these eggs had been infertile or killed by the very wet summer that the valley had experienced in 1996.

Figure 1. Sketch map of the Benasque Valley. A. Pico de Aneto (in the Maladeta Range); B. Benasque town; C. Pico de Cerler; G. El Gallinero; S. Castejon de Sos; T. El Turbon. 1. Chia; 2. Collado de Sahún; 3. Eriste; 4. Els Plans d'Abajo; 5. Anciles; 6. El Ampriu; 7. Hospital de Benasque; 8. La Besurta. Solid line with dotted line = main road running along River Esera; solid lines = other roads. See text for indication of scale.



Other July lycaenids included *Pseudophilotes baton baton* Bergstrasser and a type of *Aricia* species. Some specimens (of both sexes) collected resemble *Aricia allous* Geyer from the Parnon Mountains and Mount Veluchi in Greece (Wakeham-Dawson, *antea*: 199-203) and have no orange markings on the upper forewings. Others have reduced orange markings like the male *montensis montanabella* Verity from central Spain illustrated in Manley & Allcard, 1970 (plate 31), but none of them have the pronounced orange markings found in *montensis montensis* Verity from North Africa (Tennent, 1996: plate 12). The Benasque population may be an example of the intermediate form of *allous* and *montensis* reported from areas of Greece, North Spain, Pyrenees and south-west Alps (Coutsis, 1972; Higgins, 1975; Higgins & Riley, 1980; Leestmans & Arheilger, 1987). Male genitalia distinguish the Benasque *allous x montensis* from *agestis agestis* D.&S. (Higgins, 1975: Fig 178) found north of the Pyrenees and *agestis cramera* Eschscholtz (Higgins, 1975: Fig 178) from central Spain. However, there appears to be little to distinguish between the genitalia of Benasque *allous x montensis* and Greek *allous* (which resemble Fig 179b in Higgins, 1975). Neither *A. agestis agestis* or *agestis cramera* were found in the Benasque valley. Also flying in the meadows in July were *Heodes alciphron gordius* Sulzer, *Agrodiaetus escheri escheri* Hübner, *Mellicta parthenoides* Keferstein, *Melitaea didyma meridionalis* Staudinger and *Satyrus ferula* F.

2. Dry scrub (maquis) at c. 1200m. Around the village of Chia on the road up to the Collado de Sahún, the scrub includes oak (*Quercus*), box (*Buxus*), blackthorn (*Prunus*) and lavender (*Lavandula*). Between July-August, *A. damon*, *Coenonympha dorus* Esper and *Hipparchia semele cadmus* Fruhstorfer fly in the area, accompanied by the western European satyrids that live in dry scrub. In May/June *Glaucopsyche melanops* Boisduval were found. In late September, very worn *Hipparchia statilinus* Hufnagel were present with worn *E. neoridas*. *Clossiana dia* L. (a species which appears to be triple brooded in the Benasque valley) was very fresh and a single mint male *Gonepteryx cleopatra* L. was seen.

3. Deciduous woodland between 1000-1500m. Around Eriste, Anciles and throughout the valley, the woodland was rich with butterfly species in July. These included *Erebia meolans* de Prunner, *Limenitis reducta* Staudinger, *Apatura ilia* D.&S. and *Laeosopis roboris* Esper. In Late September, all woodland species were worn and included *E. neoridas*, female *Quercusia quercus* L. and a single female *ilia*.

4. Coniferous woodland 1300-1800m. The denser areas of coniferous woodland did not support butterflies, but new plantations, clearings and pasture just above the tree-line had a number of interesting species. In rocky pasture (c. 1600m) on the edge of pines at Els Plans d'Abajo (across the reservoir east from Eriste), *Melanargia russiae cleanthe* Boisduval

(Wakeham-Dawson, *in press*) were flying with *Hipparchia alcyone* D.&S., *Boloria pales pyrenesmiscens* Verity and *Parnassius apollo* L. in July. *Erebia triaria triaria* de Prunner were flying in the area in late May.

5. Sub-alpine slopes (above 1600m). This was the most interesting habitat type providing two types of terrain: (a) steep pasture and (b) scree slopes (at lower altitudes often interspersed with pine trees).

(a) On pasture at El Ampriu (1900m) in July, *Erebia hispania rondoui* Oberthur were flying with *Colias phicomone* Esper and *Heodes virgaureae* L. *E. rondoui* was still flying in mid-August. In July, at the Collado de Sahún (1900m), *Erebia gorgone* Boisduval and *E. epiphron pyrenaica* H-S were flying close to the short grass on very steep slopes. By late September there was no sign of any butterflies at either site, but at c. 1800m on the road to Plan west of the Collado de Sahún, mint condition *hispania rondoui* (males and females) were found flying with fresh *E. neoridas* on rocky slopes among the pine trees on 27 September. The wing colour and male genitalia of these *rondoui* were similar to those from El Ampriu in July. It appears that the flight period of *rondoui* is much longer than suggested by Higgins & Riley (1980), unless the population at the Collado de Sahún had been unusually affected by the wet summer in 1996. In September, a colony of *E. neoridas* was flying close to the ground on south facing slopes above Cerler (1600m). This species appears to fly in all the habitat types listed above, but females were more common here than elsewhere. These were basking on warm areas of bare soil and some were crawling among the grass stems, but none was observed to lay eggs.

(b) In July, on rocky slopes in the valley around the Hospital de Benasque (1760m) *Erebia euryale* Esper were flying among the pine trees where *Parnassius mnemosyne mnemosyne* L. had been flying in June. Above the tree line in July were *E. lefebvrei lefebvrei* Boisduval and *E. gorge ramondi* Oberthur. *Polymmatius eros* Ochsenheimer were present here on the lower slopes and high up near the Portillon de Benasque (2444m) were fast flying *Pontia callidice* Hübner. In late September, worn *E. neoridas* and fresh *E. pronoe glottis* Fruhstorfer were flying near streams on a south slope in clearings among the pine trees at La Besurta (1900m). Warren (1963) suggests that *pronoe* tends to be overlooked because of its late flight period. One of the male *pronoe* captured was smaller than the others and marked like *pronoe vergy* Ochsenheimer (Higgins & Riley, 1980: plate 53). The genitalia (valves) also differ from those of the *glottis* specimens. The *glottis* valves from Benasque are variable in structure but resemble those drawn for *pronoe pronoe* from Austria by Higgins (1975: fig. 346a), while the *vergy* genitalia from Benasque are similar to those drawn for *vergy* from

Switzerland by Higgins (1975: fig. 346b). In the Benasque *vergy* specimen, the distal section of the valve is less elongated and the mid-costa teeth less pronounced than in the *glottis* specimens. Higgins & Riley (1980) record that some races of *pronoe* show intermediate characters between the subspecies *pronoe*, *glottis* and *vergy*, but the appearance of two distinct forms in one population in the Benasque Valley is surprising.

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Correction: In the spring report of Benasque butterflies (Wakeham-Dawson, 1992a), *Pyrgus alveus* should read *P. malvae* L. and *P. foulquieri* should read *P. carthami* Hubner. In the list of species *Lysandra coridon* should read *L. hispana* Herrich-Schaffer and *Agrodiaetus escheri* Hübner should be included in the list.

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Appendix 1. Species of butterfly seen in the Benasque Valley between 22-29 September 1996.

All species were worn unless marked *. This indicates that adults appeared to have recently emerged. Both sexes were seen unless otherwise stated.

Papilionidae

Papilio machon L. * (females)
Parnassius apollo L. (single female with
 sphragis)

Pieridae

Pieris brassicae L. *
Artogeia rapae L.
Colias hyale L.? *
C. alfajariensis Ribbe *
Gonepteryx cleopatra L. * (single male)

Lycaenidae

Quercusia quercus L. (females)
Lycaena phlaeas L. *
Lampides boeticus L. * (single male)
Agrodiaetus damon D.&S.
A. escheri Hü.bner * (single female)
Lysandra coridon Poda
L. bellargus Rottemburg *
Polyommatus icarus Rottemburg *

Nymphalidae

Apatura ilia D.&S. (single female)
Nymphalis antiopa L. *
Inachis io L. *

Vanessa atalanta L. *
Cynthia cardui L.
Aglais urticae L. *
Argynnis paphia L. (a single female)
Issoria lathonia L. *
Clossiana dia L. * (third brood)
Mellicta deione Geyer * (second brood)

Satyridae

Hipparchia semele cadmus Fruhstorfer * (a
 single male in Benasque town centre)
H. statilinus Hufnagel (females)
Erebia hispania rondoui Oberthur *
E. pronoe glottis Fruhstorfer *
E. neoridas Boisduval * (some worn)
Pyronia tithonus L.
Coenonympha pamphilus L.
Pararge aegeria aegeria L. *
Lasiommata megera L. *
L. maera f. adrasta Illiger *
Maniola jurtina L. (females)

Hesperiidae

Spialia sertorius Hoffmannsegg *
Hesperia comma L. *